

## PAHRANAGAT VEHICLE FIRE REHABILITATION PLAN

### PAHRANAGAT NWR

#### BACKGROUND

On May 11, 1999, at approximately 7:00 a.m., a vehicle traveling north on State Highway 93 left the road and came to rest on land belonging to Pahrnagat National Wildlife Refuge. The driver, was assisted from the vehicle by passing motorists, however, the vehicle had caught fire and ignited the surrounding vegetation (primarily grasses and other fine fuels). The fire burned approximately 116 acres, all on Pahrnagat NWR, prior to containment later that same day. The fire primarily burned in two fuel types, Fuel Model One and Fuel Model 6. Fire intensity and severity was moderate.

#### REFUGE HISTORY

Pahrnagat NWR was established in January of 1964 when 3,722 acres were purchased from the Buckhorn Land and Cattle Company with Duck Stamp Funds. An additional 1,311 acres were withdrawn from public domain by Public Land Order 3348 in March of 1964, and a 347 acre lake bottom acquisition was completed in June of 1966.

The 5,380 acre refuge is located at the southern end of the Pahrnagat Valley, six miles south of the town of Alamo, Lincoln County, Nevada. The valley is 44 miles long and part of an ancient, well preserved river course approximately 0.25 to 0.5 mile wide, bordered on both sides by rocky terraces and upland desert. Pahrnagat NWR itself is about 10 miles long with an average width of approximately 0.5 mile. The topography varies from open water and bulrush marshes to cliffs and rocky outcrops on the adjacent upland deserts. Elevations range from 3,300 feet in the valley bottom to 3,800 feet on the desert slopes and rock outcrops.

The Refuge has a semiarid, continental climate. Annual precipitation is low (less than seven inches), sunshine is abundant, and the rate of evaporation is high. Temperatures are highly variable, ranging from 110 degrees in mid summer to 10 degrees in January. Rainfall is irregular, but generally occurs in winter, spring and late summer. Prevalent northwesterly winds are common during the spring months. The average annual temperature is 65 degrees. Areas with less than eight inches of rainfall rarely support enough vegetation to carry a fire.

Soils at the Refuge vary, as does the vegetation types. Geer fine sandy loam is found in the desert scrub and irrigated croplands. Seaman sandy loam is also found in the desert scrub. Ash Springs silt loam is found in the irrigated croplands and pasture. Pahrnagat silt loam is also found in the irrigated croplands and pasture. Pahrnagat-Ash Springs complex is found in the wetland and wet meadow areas of the Refuge.

Characteristically, the Refuge plant communities have adapted to a very arid climate (less than seven inches of annual precipitation). When the desert scrub communities are in good condition, shrubs are the dominant vegetative feature, and prior to Euroamerican settlement, fine fuels were limited. Areas with less than eight inches of rainfall rarely support enough vegetation to carry a

fire. Fire occurrence in areas receiving more than about eight inches has been influenced by introduced grasses. Shrub cover is generally widely spaced with large amounts of bare ground between individuals. Most species in this plant community are either somewhat fire-resistant or are vigorous re-sprouters after disturbance. Presettlement fire in such a community was likely a rare event, dependant upon extreme conditions of weather and prolonged periods of drought.

Historic overutilization of the shrub community through cattle and sheep grazing has led to declines in range condition and serious reduction of normally sparse native grass species, while allowing the introduction of exotic annuals. In recent years exotic annuals have invaded increasingly large areas of the salt-desert community, including portions of the Pahrangat NWR. In particular, cheat grass (*Bromus tectorum*) has become co-dominant in some upland areas. This invasion has dramatically altered fire intervals in this ecosystem, from a rare event to often greater than one fire per ten years. When fire is applied to the desert-shrub community, with few or no perennial plants and an exotic annual component present in the understory, the post-fire community will very likely be dominated by annuals. Other invasive species present include saltcedar (*Tamarix ramosissima*), Russian knapweed (*Centaurea repens*), and spotted knapweed (*Centaurea maculosa*).

## EVALUATION AND ANALYSIS

The majority of the fire burned through an area of shrub/scrub wetland which was historically wet meadow dominated by grasses and sedges until the hydrology was altered decades ago by excavation of a ditch between the middle marsh and lower lake. The surface is sandy loam. A few feet below that layer is peat. The water table has dropped significantly and the land surface drained allowing more dry land species such as rabbit brush to invade. Soils are moist and highly alkaline and still support marsh plants like wire grass and yerba mansa.

The Vehicle Fire consumed nearly all of the grasses and forbs found within the wildfire burn area. The shrub vegetation was also affected. Saltcedar, a noxious invasive species was burned, however, it will typically respond through resprouting and creating even thicker, monotypic stands that will choke out the desirable native plant species, increase soil salinities, and transpire large quantities of water. While the area has been invaded by saltcedar, it is still at a controllable stage if steps are taken now to prevent the saltcedar from taking over the area and crowding out the native forbs and grasses.

The only Refuge physical structure damaged by the fire was approximately 60 rods of four-strand barb wire fence and boundary signs located adjacent to the State Highway 93. This fence is no longer needed, however, in its current state it is a safety hazard and an eyesore that should be removed. The boundary signs need to be reinstalled.

## REHABILITATION NEEDS AND OBJECTIVES

The following needs and objectives have been identified for rehabilitation of the Vehicle Fire on Pahrangat NWR.

1. Reduce or eliminate wind and water erosion of soil.
2. Prevent the invasion of exotic plant species such as cheatgrass (*Bromus tectorum*), which grows primarily on upland soils, and prevent the spread of existing invasive species such as saltcedar.
3. Protect burned area to allow for maximum recovery of native grasses, forbs, and shrubs.

#### Rehabilitation Alternatives:

1. No Action Alternative.

Under this alternative, the burn area would be allowed to re-vegetate naturally. Bulldozed fireline would not be seeded with native perennial grasses. No action would be taken to minimize or reduce the establishment of exotic plants. The burned fence would not be removed. No action would be taken to prevent the spread of noxious invasive species such as cheatgrass and saltcedar.

2. Soil Stabilization and Protective Alternative (The Preferred Alternative).

Under this alternative, areas where the soil was severely disturbed would be reseeded with native vegetation to reduce the establishment of exotic plants, reduce soil erosion, and increase soil stability. The burned fence along State Highway 93 would be removed. Mechanical or chemical treatment would be utilized to prevent the saltcedar from resprouting and creating even denser, monotypic stands. Chemical treatment would consist of cutting all of the saltcedar within the 116 acre burned area and treating the stumps with Garlon or another pre-approved herbicide.

#### ENVIRONMENTAL CONSIDERATIONS

1. No Action Alternative.

Erosion of soil by wind and water would continue for several years, but would decline over time. Increased run-off in uplands would result in greater sediment transport and greater ditch bank erosion, which would degrade downstream water quality and clarity, as well as increase siltation.

Disturbed areas would be invaded by exotic plant species. Establishment of desirable native grass, forb, and shrub species would be reduced because of increased soil erosion and competition from non-desirable invasive species.

Species and structural diversity would remain low and result in poor quality wildlife habitat. Aesthetic values would remain low. Once exotic plant species became established, severely disturbed areas would remain visible for many years.

2. Soil Stabilization and Protection Alternative (The Preferred Alternative).

Soil erosion by wind and water would be minimized under this alternative. Seeding of severely

disturbed areas with native vegetation would provide the greatest protection against loss of soil. Reduction of water quality and stream bed sedimentation would be minimized.

Removal of the burned fence along the highway would provide a safer, more aesthetically pleasing experience for Refuge visitors and drivers passing through the area.

Aesthetic values would increase. Severely disturbed areas seeded with desirable native plant species would blend with the surrounding vegetation over time.

The management strategies outlined in the preferred alternative of the Draft Cropland and Grazing Management Plan discuss the use of prescribed fire to achieve Refuge goals and objectives in the following: "Phase-out grazing ...grazing of approximately 150-175 head of cattle would continue on approximately 300 acres of the Middle Marsh unit but would be phased out as a management tool on the Refuge before year 2003 and replaced with fire and mowing where appropriate. .... Mowing and or burning would replace grazing as a management tool to remove decadent vegetation and promote new growth. Desirable forage species, both annuals and perennials, would become more abundant, reach a larger size, mature and thus produce seed."

"Areas which were typically cropped short by grazing would provide a higher quality and quantity of cover and food for a wider variety of wildlife, thus increasing the biodiversity of the Refuge. A phase-out of the grazing program would improve vegetative and structural (primarily burrowing habitat) habitat components essential to the desert tortoise (threatened Mojave population) which occurs on the Refuge."

The Refuge Fire Management Plan, also currently in Draft, reinforces the management proposals found in the Draft Cropland Management Plan.

## SUMMARY OF ANTICIPATED RESOURCE NEEDS AND COSTS

1. Reseed approximately 0.6 acres severely disturbed by bulldozing fireline with native grasses and 100 acres disturbed through treatment ofresprouting saltcedar. (See Attachment A).

Native grass seed	\$3,655
Labor	\$1,520

2. Remove and re-sign burned fence along State Highway 93

Labor	\$600
Signs & posts	\$ 250

3. Chemical/Mechanical Treatment of Saltcedar

Herbicide	\$2,500
Fuel for Equipment	\$250

Labor                      \$1500

Total Cost                \$10,275

Photo and maps stored in project files.

#### ATTACHMENT A

Species	Cost/lb (\$)	Pounds Seed/Acre	Total Rehab Acres	Total Seed (lbs)	Total Cost
Alkali Sakaton (Sporobolus airoides)	5.75	3.0	100	300 1.75M/lb	1725
Sand Dropseed (Sporobolus cryptandrus)	5.00	1.0	100	100 5.3M/lb	500
Fourwing Saltbush (Atriplex canescens)	6.25	2.0	100	200 100,000/lb	1250
Alkali Bulrush (Scirpus sp.)	18.00	1.0	10	10	180
Grand Total					3655